Listing of Claims:

1. (Previously presented) A light emitting device comprising:

a light guide having an elongate transparent core surrounded by an optically transmitting sheath;

one or more light sources coupled to a first end of said light guide; and

transparent diffuser particles distributed within the core to scatter light in a substantially forward direction from the first end of said core toward a second end of said core;

wherein the diffuser particles have low back reflectance and low absorbance; and

wherein the ratio of the refractive index of the diffuser particles to the refractive index of the core equals $1 + \mu$, and μ has variance over a wavelength range of said one or more light sources; and

wherein $0.010 \leq |\mu| < 0.035$ at the average wavelength of the one or more light sources.

2 (Previously presented) The light emitting device of claim 1 wherein light emitted from the second end of the core has colour variation imperceptible to the human eye and gradual variations in intensity.

3 (Previously presented) The light emitting device of claim 2 wherein a concentration of the diffuser particles in the core and a length of the light guide are varied to achieve the colour variations imperceptible to a human eye and the gradual variations in intensity in said emitted light.

4 (Previously presented) The light emitting device of claim 1 wherein the optically transmitting sheath has a lower refractive index than the core.

5. (Cancelled)

6. (Cancelled)

7. (Previously presented) The light emitting device of claim 1 wherein $\mu = 0.018$ at a wavelength of 589nm.

8. (Previously presented) The light emitting device of claim 1 wherein $\mu = 0.011$ at a wavelength of 589nm.

9. (Previously presented) The light emitting device of claim 1 wherein the diffuser particles yield a high ratio of light that is forward transmitted with small angular deviation to back reflected light.

10. (Previously presented) The light emitting device of claim 1 wherein a concentration of the diffuser particles in the core varies along a length of the core.

11 (Previously presented) The light emitting device of claim 1 wherein said light guide comprises an axial diffuser particle number in the range of about 6 – 300.

12. (Previously presented) The light emitting device of claim 1 wherein said light guide comprises an axial diffuser particle number in the range of about 6 – 50.

13 (Previously presented) The light emitting device of claim 1 wherein said light guide comprises an axial diffuser particle number in the range of about 50 – 300.

14 (Amended) The light emitting device of claim ~~6~~ 1 wherein said axial diffuser particle number is in the range of about 20 – 40.

15 (Previously presented) The light emitting device of claim 1 wherein the diffuser particles have a size substantially greater than a wavelength of light emitted by said one or more light sources.

16. (Previously presented) The light emitting device of claim 1 wherein said one or more light sources are selected from: LEDs, incandescent sources, discharge lamps, lasers, or other high brightness sources.

17. (Previously presented) The light emitting device of claim 1 further comprising control means for controlling the output of said one or more light sources across a range of wavelengths.

18. (Previously presented) The light emitting device of claim 1 wherein said light sources are in the form of an LED array.

19. (Previously presented) The light emitting device of claim 1 wherein said light sources are in the form of an LED array emitting red, green and blue light.

20. (Previously presented) The light emitting device of claim 1 further comprising control means for controlling the output of said one or more light sources across a range of wavelengths, said one or more light sources being an LED array wherein the relative outputs of said LEDs are adjusted via said control means such that said light emitted from said second end of said core is tunable across a wavelength range of said one or more light sources.

21. (Previously presented) The light emitting device of claim 1 comprising at least two light sources, each said light source emitting light having a characteristic angular distribution function, wherein the angular distribution functions of all light sources are similar.

22. (Previously presented) The light emitting device of claim 21 wherein the angular distribution functions of all light sources are the same.

23. (Previously presented) The light emitting device of claim 1 further comprising a coaxial reflector surrounding said light guide to reflect light escaping from said core back

through said core towards the second end of said core, said reflected light increasing the luminous output of said light guide.

24. (Previously presented) The light emitting device of claim 1 wherein the core is a polymer.

25. (Previously presented) The light emitting device of claim 1 wherein the core is glass.

26. (Previously presented) The light emitting device of claim 1 wherein the sheath is a cladding of low refractive index polymer.

27. (Previously presented) The light emitting device of claim 26 wherein the polymer is a fluoro-polymer.

28. (Previously presented) The light emitting device of claim 1 wherein the sheath is a cladding of aerogel or low refractive index glass

29. (Previously presented) The light emitting device of claim 1 wherein the sheath is selected from: a layer of water; a low refractive index liquid; air; other gas; or vacuum.

30. (Previously presented) The light emitting device of claim 1 wherein the sheath is transparent.

31. (Previously presented) The light emitting device of claim 1 wherein the sheath is translucent.

32. (Previously presented) The light emitting device of claim 1 wherein the diffuser particles are made from a polymer.

33. (Previously presented) The light emitting device of claim 32 wherein the diffuser particles are in the form of particles that are not dissolved by a monomeric mixture used to produce the polymer core.

34. (Previously presented) The light emitting device of claim 32 wherein the diffuser particles are a cross-linked polymer, such as PMMA or polystyrene.

35. (Previously presented) The light emitting device of claim 24 wherein the polymer core is formed by extrusion or injection moulding.

36. (Previously presented) The light emitting device of claim 24 wherein the polymer core is formed by extrusion or injection moulding from uncross-linked PMMA and the diffuser particles are formed of cross-linked PMMA.

37. (Previously presented) The light emitting device of claim 1 wherein the diffuser particles are made from transparent non-polymeric materials, such as glass.

38. (Previously presented) The light emitting device of claim 1 wherein the diffuser particles are spherical.

39. (Previously presented) The light emitting device of claim 1 wherein the diffuser particles are selected from one of: cylindrical; polyhedral; ellipsoidal; or asymmetrical in shape.

40. (Previously presented) The light emitting device of claim 1 wherein the diffuser particles have a size in the range 5 μm to 50 μm.

41. (Previously presented) The light emitting device of claim 1 wherein the diffuser particles have a size in the range 25 μm to 35 μm.